National Aeronautics and Space Administration
Goddard Space Flight Center

Inside Wallops

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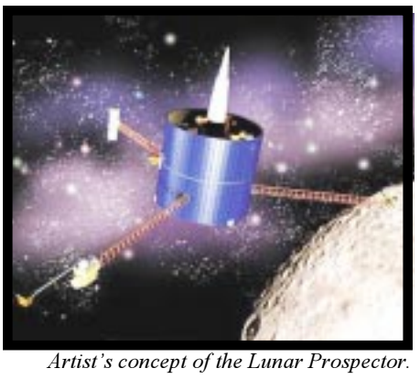
No Water Ice Detected From Lunar Prospector Impact

The controlled crash of NASA's Lunar Prospector spacecraft into a crater near the south pole of the Moon on July 31 produced no observable signature of water, according to scientists digging through data from Earth-based observatories and spacecraft such as the Hubble Space Telescope.

This lack of physical evidence leaves open the question of whether ancient cometary impacts delivered ice that remains buried in permanently shadowed regions of the Moon, as suggested by the large amounts of hydrogen measured indirectly from lunar orbit by Lunar Prospector during its main mapping mission.



Artist's concept of the Lunar Prospector.

In a low-budget attempt to wring one last bit of scientific productivity from the mission, NASA worked with engineers and astronomers at the University of Texas (UT) to precisely crash the barrel-shaped spacecraft into a specific shadowed crater. NASA accepted the team's proposal based on a scientific peer review of the idea and the pending end of the spacecraft's useful life, although the chances of positive detection of water were judged to be less than 10%.

Worldwide observations of the crash were focused primarily on using sensitive spectrometers tuned to look for the ultraviolet emission lines expected from the hydroxyl (OH) molecules that should be a by-product of any icy rock and dust kicked up by the impact of the 354-pound spacecraft.

"There are several possible explanations why we did not detect any water signature, and none of them can really be discounted at this time," said Dr. Ed Barker, assistant director of the McDonald Observatory at UT Austin, who coordinated the observing campaign. These explanations include:

* the spacecraft might have missed the target area;
* the spacecraft might have hit a rock or dry soil at the target site;
* water molecules may have been firmly bound in rocks as hydrated mineral as opposed to existing as free ice crystals, and the crash lacked enough energy to separate water from hydrated minerals;
* no water exists in the crater and the hydrogen detected by the spacecraft earlier is simply pure hydrogen;
* studies of the impact's physical outcome were inadequate;
* the parameters used to model the plume that resulted from the impact were inappropriate;
* telescopes used to observe the crash, which have a very small field of view, may not have been pointed correctly;
* water and other materials may not have risen above the crater wall or otherwise were directed away from the telescopes' view.

Although the crash did not confirm the existence of water ice on the Moon, "this high-risk, potentially high-payoff experiment did produce several benefits," said Dr. David Goldstein, the aerospace engineer who led the UT Austin team. "We now have experience building a remarkably complex, coordinated observing program with astronomers across the world, we established useful upper limits on the properties of the Moon's natural atmosphere, and we tested a possible means of true 'lunar prospecting' using direct impacts."

The $63 million Lunar Prospector mission was led by Dr. Alan Binder of the Lunar Research Institute, Tucson, AZ, and managed by NASA's Ames Research Center. It was built by Lockheed Martin Missiles & Space, Sunnyvale, CA. Other participating organizations included the Department of Energy's Los Alamos National Laboratory, NM, and NASA's Goddard Space Flight Center and Jet Propulsion Laboratory, Pasadena, CA.

'Ozone Hole' Smaller

A NASA satellite has shown that the area of ozone depletion over the Antarctic — the well-known ozone "hole" — is a bit less in 1999 than it was last year.

Preliminary data from the satellite show that this year's Antarctic ozone depletion covered 9.8 million square miles on Sept. 15. The record area of Antarctic ozone depletion of 10.5 million square miles was set on Sept. 19, 1998.

The slightly decreased size of the ozone "hole" from last year is not an indication of the recovery of Antarctic ozone levels. The current year-to-year variations of size and depth of the ozone "hole" depend primarily on the variations in meteorological conditions.

The Antarctic ozone losses are caused by chlorine and bromine compounds released by chlorofluorocarbons (CFCs) and halons. Due to international treaties regulating the production of these gases, the amount of chlorine in the stratosphere is close to maximum value and, in some regions, is beginning to decline. In the next century, chlorine-induced ozone losses will be reduced as chlorine amounts throughout the stratosphere decline, and ozone levels will begin to recover.

The actual rate of recovery will likely be affected by the increasing abundance of greenhouse gases in the atmosphere. Detecting the recovery of the ozone hole will require a number of years of measurements.

The measurements were obtained between mid-August and early October using the TOMS instrument aboard NASA's Earth Probe satellite. NASA instruments have been measuring Antarctic ozone levels since the early 1970s. Since the discovery of the ozone "hole" in 1985, TOMS has been a key instrument for monitoring ozone levels over the Earth. TOMS ozone data and pictures are available on the Internet: http://toms.gsfc.nasa.gov or http://pao.gsfc.nasa.gov/

October is National Disability Employment Awareness Month By the President of the United States of America

To recognize the enormous potential of individuals with disabilities and to encourage all Americans to work toward their full integration into the workforce, the Congress, by joint resolution approved Aug. 11, 1945, as amended, has designated October of each year as "National Disability Employment Awareness Month".

NOW, THEREFORE, I, WILLIAM J. CLINTON, president of the United States of America, do hereby proclaim October 1999 as National Disability Employment Awareness Month. I call upon government officials, educators, labor leaders, employers and the people of the United States to observe this month with appropriate programs and activities that reaffirm our determination to fulfill both the letter and spirit of Americans with Disabilities Act.

Federal Women's Day

Federal Women's Day at Wallops will be held Oct. 21.

Celeste Robertson will be back for a morning training session to help us de-stress and spring into action.

The luncheon speaker will be Deborah Blair who will offer explanations as to how the myths we learn as we grow up affect the perceptions we have as adults.

An afternoon workshop to define core values and set goals will be facilitated by Daisy Saunders.

For a complete schedule, contact Pat Pruitt, x1145.

American Red Cross Blood Drive
Oct. 27
9:30 a.m. to 2:30 p.m.
Bldg. F-3

For an appointment call Diane Weller, x1336 or x1766. Walkin-ins are welcome!

Upcoming Training

Space Courses

The Applied Technology Institute is sponsoring several seminars to help professionals stay up-to-date in space technology. These seminars emphasize how today's technology is incorporated into the planning, designing and testing of modern space systems. The courses are designed for engineers and scientists who wish to enhance their systems engineering skills or who want to learn the latest in specific disciplines. For a detailed outline and a schedule of courses visit:
http://www.aticourses.comschedule.htm
Call 410-531-6034 now to reserve a spot.

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Basic Risk Management and System Safety Practice

When: Nov. 15 - Nov. 19
Where: Wallops

The course is offered at no cost to NASA civil service and contractor employees. Anyone interested in attending should contact Joe Drawdy, x1884 by Oct. 27.

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Tools for Navigating Change

When: Nov. 9
Where: Wallops,
Bldg. E-104, Chincoteague Room
Who should attend: secretarial and clerical personnel.

Please make every effort to attend this opening session to learn more about training opportunities available for support personnel through the TNC program. To register for the kick-off or receive additional information, contact Pat Pruitt, x1245.

OKTOBERFEST

October 23
Noon – 5 p.m.

At the Wallops Ball Field

German food, hot dogs and beverages

Children's Activities and Music

Contact Bev Hall, x1714 or Gerry McIntire, x1889.

Annual Navy Family Housing Yard Sale
(Blades Circle & Skeeter Lane)

October 30
7:30 a.m. - 1:30 p.m.
(rain or shine)

Fire Department Responses

From Oct. 1 to Oct. 14 the Wallops Fire Department responded to eight structural alarms on Base.

Combined Federal Campaign Celebration

1999 Combined Federal Campaign
Oct. 1 - Oct. 31, 1999

Congratulations to Team Code 200, People's Choice and Glenda Wells, Management Choice for first place in the chili cook-off and to Richard Turner, winner of the 50/50 drawing.

For Sale

Queen size pedestal waterbed with headboard, matching dresser with lighted mirror. $425. Phone: (757) 336-3545

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